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ABSTRACT

This paper examines the relationship between preservice teachers' epistemological beliefs and their perceptions of their college preparatory work as being instrumental to their futures, arguing that preservice teachers often find little relevance in the theoretical, philosophical, and historical content presented in their preparatory classes. Nor do they find efforts to promote more critical, reflective, and complex thinking instrumental to future teaching. The perception that teacher education emphasizes abstract meanings rather than practical content may be noteworthy because of the tendency for practicing teachers to maintain their beliefs that undergraduate training was ineffective or irrelevant. One reason for decreased motivation among preservice teachers to participate fully in required learning tasks may relate to a perceived structural incongruence between what they understand about the nature of teaching and the epistemological requirements associated with learning tasks. This incongruence may pose significant motivational problems during teacher training. It is hypothesized that when the content of preservice teachers' goals is at odds with the epistemological requirements of learning tasks, those tasks may be perceived as less instrumental to students. This may result in short-term efforts to manage learning tasks by ignoring task-associated complexities and redefining them in well-structured terms and/or engaging in various self-handicapping strategies designed to attribute perceived future failure to non-ability factors. (Contains 40 references.) (SM)

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An Analysis of Preservice Teacher Perceptions of Instrumentality Through the Lens of Epistemological Theory

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Abstract

This paper examines the relationship between preservice teachers' epistemological beliefs and their perceptions of their college preparatory work as being instrumental to their futures. It is argued that preservice teachers often find little relevance in the theoretical, philosophical, and historical content presented in their preparatory classes. Nor do they find efforts to promote more critical, reflective, and complex thinking instrumental to their futures as professionals. The perception that teacher education focuses on abstract meanings rather than practical content, thus, may be a significant factor in the tendency for practicing teachers' to maintain their beliefs that training was ineffective or irrelevant at the undergraduate level. One reason for the decreased motivation among preservice teachers to participate fully in required learning tasks may be related to a perceived structural incongruence between what they understand about the nature of teaching (as a well- versus ill-structured endeavor) and the epistemological requirements (well- versus ill-structured knowledge and problem-solving) associated with learning tasks. It is this incongruence that may pose significant motivational problems during teacher training. Therefore, it is hypothesized that when the content of preservice teachers' goals is at odds with the epistemological requirements of learning tasks, those tasks may be perceived as less instrumental to students. This may result in short-term efforts to manage learning tasks by a) ignoring task-associated complexities and redefining them in well-structured terms and/or b) engaging in any number of self-handicapping strategies designed to attribute perceived future failure to non-ability factors. Implications for future practice and research are also discussed.

Introduction

The quality of teacher education has come under fire over the past two decades for not adequately preparing future teachers for managing the complexities of professional practice. Indeed, research suggests that practicing teachers often hold negative views regarding the level of their professional preparation (Aksamat, 1990; Hummel & Strom, 1987; Lyon, Vaassen, & Toomey, 1989) and its fit with the realities of day-to-day teaching. For example, in a study by Askamat (1990), it was found that practicing teachers who had undergone university training with an infused mainstream curriculum perceived their preparation to be ill-suited for meeting the demands of working with diverse students. One of the major complaints about their preparation was the insufficient content coverage provided. This reportedly decreased subjects' perceived efficacy for working with students from diverse backgrounds. In another study, Hummel and Strom (1987) compared post-graduate practicing and non-practicing beliefs about the adequacy of their preparation for professional practice. Upon comparison between graduates with a) no experience, b) one year of experience, and c) two years experience, they found that teachers who had been practicing for both one and two years were significantly less optimistic about their preparation than those individuals with no experience. A possible reason for this finding may be that the non-practicing teachers had not yet been exposed to the complex realities of classroom life. Thus, they were ill-suited to make judgments about their own preparation. Finally, Soodak and Podell (1997) reported similar findings in their exploration of the relationship between teacher experience and self-efficacy. When preservice teachers were compared with practicing teachers with a variable number of years' experience, they found a significant drop in perceptions of personal efficacy following graduation and initiation into practice. Essentially, those teachers who had been practicing for 1-2 years reported holding significantly lower perceptions of personal efficacy than individuals who were either enrolled in teacher preparation programs or who had been practicing for more than 2 years. Again, this suggests that preservice teachers have not had experience with the ill-structured nature of classroom problems and, thus are more optimistic about their abilities. Those with more experience (over 2 years), on the other hand, may perceive themselves as more efficacious because they have found a way to navigate ill-structured classroom problems by recognizing the difficulties inherent in seeking well-structured solutions.

Interestingly, despite preservice teachers' more positive outlook on their training as opposed to practicing professionals within their first few years of experience, teacher education

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programs have still have their complaints by students. In fact, it is not uncommon to hear undergraduates voicing their frustrations over having to learn about theory and research when, instead, "practical knowledge" would be more useful. This can be found in recent debates about the relevance of educational psychology (Anderson, Blumenfeld, Pintrich, Clark, Marx, & Peterson, 1995; Wittrock, 1992) and foundations courses (Sirotnik, 1990) to teacher preparation. Recently, for example, my colleagues and I reviewed data on preservice teachers' perceptions of various courses within our own teacher education program. Unfailingly, courses in methods were cited as being most relevant to students' futures, whereas educational psychology and foundations courses tended to be perceived as holding little utility. This discrepancy in perceived utility of educational theory (not necessarily isolated to just educational psychology and foundations) and practice is best illustrated by Kagan (1992): "procedural knowledge appears to be the sine qua non of classroom teaching; novices sense this and continue to express their frustrations with the abstract content of most education courses" (p. 162). Thus, one of the failings of teacher education, as perceived by preservice teachers is that there is a glowing discrepancy between the academically-structured environment associated with university-based teacher training and the everyday problems of real-world practice (Elliot, 1989). Furthermore, it seems plausible that this perception of irrelevance may subsequently be the excuse (e.g., "I was not adequately prepared") practitioners subsequently draw upon when they feel little personal efficacy.

The studies and anecdotes described above provide evidence that teacher education and, more specifically, those courses steeped in psychological, historical, and philosophical content are often perceived as holding minimal value to preservice teachers and practitioners. It appears likely that these types of perceptions may limit the kind of knowledge that future and current professionals acquire about the teaching profession and the management of ill-structured problem situations. Thus, teachers-in-training and young practioners may very well seek out well-structured solutions to problems as opposed to engaging the natural reflective processes that can help them to navigate the ill-structured waters of everyday practice (Schon, 1988).

Given the problems with fit between ill-structured problems and well-structured solutions, several questions emerge as investigative points within this paper: "How is it that ill-structured learning tasks and/or content is perceived as being less instrumental to becoming a good teacher than well-structured solutions to problems?" "What can instructors and programs do in order to effect changes in students' motivation to develop their thinking in such a way as to

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improve the likelihood of being able to manage effectively within a complex classroom environment?" It is argued that several factors affect perceptions of course- and task-related instrumentality in teacher education: a) the interaction between students' level of epistemological development and prior knowledge on conceptions of the nature of teaching, b) students' understanding of the epistemological requirements of content and/or tasks, and c) student projections of relevance and evaluations following task-specific feedback. In effect, I argue that in order to understand and effect preservice teacher motivation – and more specifically, perceptions of task-related instrumentality, the interaction between prior knowledge and epistemological development must be taken into account. I begin this paper by providing a basic review of goal theory.

A Brief Review of Goals

According to motivational theory and research, goal formation is a key component in developing the motivation to enact behavior (Bandura, 1989; Heckhausen & Kuhl, 1987; Meece, 1994). Essentially, goals serve as the future "objects" (Karnoil & Ross, 1996; Nuttin, 1987), or standards, against which present-oriented action is directed and subsequently evaluated (Bandura, 1989). As Carver and Scheier (1990) stated, "human behavior is a continual process of moving toward various kinds of mental goal representations, and…this movement occurs by a process of feedback control". Thus, individual behavior becomes energized when there is a perceived incongruence between one's current state of affairs and a desired goal object, with feedback serving to inform the person of the degree to which progress along the way. This allows for a continual re-adjustment of present-oriented behavior that allows for a better fit between one's current situation and the goal object.

For preservice teachers, the perceived incongruence between their goal of becoming teachers and their present status as students should serve as motivation to engage in required educational activities during training. Furthermore, this discrepancy should also have the effect of increasing attention to feedback in order to attain their desired long-term goal. At worst, the process of learning to teach means "jumping through the hoops" (e.g., taking tests, practice teaching, going to class) in order to get the necessary credentials. This type of mindset appears to be most consistent with the striving for intermediate performance goals (Meece, 1994) and decreased learning-orientation. During teacher preparation, tasks requiring ill-structured learning and problem-solving may be may be defined as being exogenously instrumental (Husman &

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Lens, 1999) if students perform them without attempting connect them with their possible futures or self-schema. Indeed, according to Husman and Lens (1999), exogenously instrumental tasks are those that have little perceived relevance for attaining goal objects beyond the extrinsic rewards (e.g., teaching certificate) available. On the other hand, teachers-in-training may choose to engage in learning tasks because they are consistent with their self-schema (Garcia & Pintrich, 1994; Nuttin, 1987) and fit with their perceived future goals more intimately. This may have the effect of making learning tasks, even ill-structured ones, more endogenously instrumental (Husman & Lens, 1999) to their future teaching. Further, these types of task perceptions may also contribute to learners' eventual experience of flow (Csikszentmihalyi, 1990).

Research suggests that motivation to engage in goal-directed behavior is influenced by a number of evaluative processes that ultimately suggest whether or not one will succeed or fail in reaching a goal and finds a goal valuable (Atkinson, 1964). According to Heckhausen and Kuhl (1985), pre-decisional evaluation processes occur before efforts to maintain motivation through self-regulatory strategies and subsequent behavioral enactment. These cognitive evaluations generally are influenced by a) prior knowledge about particular goals objects (Kuhl, 1987), b) the weights given among competing goals (Heckhausen & Kuhl, 1987), c) attributions about past successes and failures (Weiner, 1985), individual goal- and achievement-orientations (Harackiewicz & Barron, 1998; Meece, 1994), d) and assessments of the time, opportunity, and importance for reaching specific goals (Heckhausen and Kuhl, 1985).

In addition to the above evaluative considerations, an individual's striving to attain a goal is also influenced one's future time perspective, or "the degree to which and the way in which the chronological future is integrated into the present life-space of an individual through motivational goal-setting processes" (Husman & Lens, 1999, p. 114). According to FTP theory, each individual has a life-space that consists of his/her temporal perception of the past, present, and future. This space may be very small, thus encompassing only the present, or large, thereby incorporating greater perceptions of the past and future – in either case reflecting a general future orientation. The extent to which individual goals are projected into one's life space, therefore, may have a significant impact how relevant they perceive specific tasks to be. For example, preservice teachers who have a longer life space may view learning tasks as being more instrumental to their future careers because they can actually "see" their futures more clearly. On the other hand, those with very short life-spaces may tend to have a less clear picture of their

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futures and, thus, may be less able to "see" the connection between what they are learning and their futures.

Although the motivational research has identified many contributing factors to goal identification and the development of intention (as noted above), I will now address two factors that, through their interaction, may have particular bearing on how preservice teachers view the instrumentality of their learning tasks: epistemological development and prior knowledge. Indeed, epistemological influences on motivation have been relatively scant in the literature. Therefore, it appears necessary to examine how preservice teachers' goals may be influenced by their epistemological level of development and its interaction with prior knowledge. It is this interaction that subsequently may impact how tasks are perceived in relation to teaching goals.

A Brief Overview of Epistemological Development in the College Years: Relevance to Teacher Education

Intuitively, one may reason that individuals who have successfully entered into teacher education programs are likely to fall at or near the formal operational level of Piaget's developmental scheme (Piaget, 1969). After all, the ability to be successful in college and within specific degree programs generally requires a level of thinking that goes well beyond the mental manipulations of concrete objects found in upper elementary-aged children. Generally, then, it is assumed that preservice teachers are capable of systematic, scientific, and hypothetical thinking (Schaffer, 1999). Interestingly, it has been suggested that cognitive development does not cease, nor remain undifferentiated, once an individual has reached the level of formal operational thought (Boyes, Chandler, 1992; Kitchener & King, 1990; Perry, 1970; Piaget, 1972). In fact, one criticism that has been leveled against Piaget's scheme is that it fails to address the qualitative changes in thought that occur between adolescence and adulthood – a time period marked by significant changes in how information is processed and organized within the learner. Secondly, it has been argued that formal operations do not adequately capture epistemological changes in reasoning about problems with variable structures (Kitchener & King, 1990) over time. According to Kitchener and King (1983), problems come in the form of "puzzles" and "ill-structured" problems. Puzzles are defined as "well-structured problem(s)" that may be solved "by the correct application of an algorithm" (p. 224), and ill-structured problems are those for which no single, correct, or "unequivocable solution…can be effectively determined" (p. 224) during the decision-making process. The argument by Kitchener and King (1990), therefore, is that some individuals may be more capable of addressing puzzles as opposed to ill-structured

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problems, while others are capable of both modes of problem-solving given their current developmental levels. For programs and instructors working with preservice teachers, this suggests the need to examine the role of epistemological development more closely. Indeed, if content and procedures are aimed at students irrespective of how they approach problem-solving or conceive of the nature of knowledge, they run the risk of not only being perceived as irrelevant or non-instrumental, but also de-motivating students from embracing more complex modes of thought.

Development of Epistemological Thought

The role of epistemological beliefs in learning and problem-solving has been studied by a number of researchers (Kitchener and King, 1981; Perry, 1970; Schommer, 1990), each with individualized ways of defining and operationalizing those beliefs. For the purposes of this paper, epistemological beliefs will refer to individual conceptions about the nature of knowledge. More specifically, they address individuals' notions about what knowledge is, where it comes from, and what forms that it may take.

According to Perry (1970, 1981), Kitchener and King (1981, 1990, 1994), and Belenky, Clinchy, Goldberger, & Tarule (1986), epistemological beliefs generally follow a developmental course that involves increasingly complex perspectives on the nature and origin of knowledge. It is this progression provides an adaptive mechanism whereby individuals become more capable of dealing with both the well- and ill-structured problems of which they are presented. According to Perry (1970), epistemological beliefs – following the Piagetian approach – develop via the joint processes of assimilation and accommodation as individuals interact with their respective environments. Thus, individuals adapt their cognitive schema to meet the demands of environmental constraints. For college-students, these ongoing processes occur as individuals experience the diversity of cultures, professorial instructional approaches, and peer belief patterns (Perry, 1970). In effect, complex experiences challenge simplistic conceptions of knowledge resulting in individual adaptations over time.

In the interest of time and space, I provide a brief integrative perspective on individuals' epistemological development. Although Perry (1970), Kitchener and King (1994), and Belenky et al. (1986) provide very similar developmental accounts, they generally involve a number of positional, or substage, demarcations. Thus, in order to maintain brevity within this discussion, I will use Perry's (1970) broadly-defined stage (rather than position) demarcations rather than outline the subscales within them: "modification of dualism", "realization of relativism", and

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"evolving of commitments" (p. 65). As should be inferred by the reader by now, each of these stages incorporates a specific set of assumptions on the nature and origin of knowledge. Furthermore, these assumptions impact how one perceives and manages problems (well- versus ill-structured).

To begin, Perry (1970) noted that students entering the university system tend to view knowledge in dichotomous terms – or right and wrong. At the most fundamental level, individuals believe that knowledge is something handed-down by authority. Furthermore, since "knowledge exists absolutely", "one's own views and those of authority are assumed to correspond to each other" (Kitchener & King, 1981, p. 93). As individuals develop through this "modification of dualism stage", their schema change to incorporate the idea that some authority are more knowledgeable than others, and when knowledge is not known, it is still "out there" to be obtained. At this stage, problems are perceived as being well-structured in nature. Solving problems involves acquiring the correct information from the "right" conduits – that information being both certain and simple (Schommer, 1990). Therefore, for preservice teachers, learning to teach serves as a well-structured problem that is solvable when instructors provide direct and correct information on the "what" and "how" of teaching. Information that is presented at an epistemological level above what those students can cognize may be misunderstood and disregarded. For example, theoretical constructs, with their inherent tendency to be ill-structured often creates problems for students wanting "hard and fast" answers. In addition, assignments whereby these preservice teachers are asked to integrate information at a deeper level via reflections and class discussions create difficulties given that they may not be particularly adept at pulling together diverse content or arguing positions based on more relativistic thinking.

According to Perry (1970, 1981) exposure to the diverse college environment begins to effect changes in how individuals view knowledge. Specifically, students begin to question "Who is, in fact, right?" This question does not only become a focal concern as students become aware of discrepant peer attitudes and belief systems; it also comes about through observation of many seemingly incongruent perspectives offered by professors. Since individuals see the world so differently, it begins to make intuitive sense for students to question the objectivity of knowledge. Indeed, as students move from stage 1 to 2, the subjectivity of knowledge comes to the fore, and relativistic thinking becomes manifest. At this level, problems and solutions associated with learning become less well-structured because absolutes are nowhere to be found.

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This often means that individual opinions are "right" from each person's point of view. For preservice teachers within this stage of reasoning, practical knowledge handed down by authority is not all there is. Rather, beliefs such as "everyone has a right to his or her own opinion and "no one has the market cornered on knowledge" prevail. Therefore, because of their newfound beliefs in relative knowledge, these preservice teachers may not explore the deeper assumptions underlying their own, as well as others', beliefs and behavior. At this stage then, commitments tend to be rather tenuous and, it appears that oftentimes, eclecticism prevails. Indeed, it is not uncommon to hear individuals at this level report that they are eclectic when it comes to choosing theory since "all of them are right". This commitment is tenuous in that the inherent consistencies and values associated with others' systems for reasoning or inquiry have not been deeply considered.

Finally, the last stage that I consider is that of "evolving commitments" (Perry, 1970). Across this set of substages, individuals develop much more complex conceptions of the world, while knowledge is still considered to be quite relative. However, unlike the previous stage, valued knowledge is most aptly described as "the outcome of the on-going process of reasonable inquiry which ultimately leads to a concordance between belief and reality" (Kitchener & King, 1981, p. 100). In this sense, the issue is not whether knowledge is objective or subjective. Rather, it is the degree to which knowledge is based in appropriate inquiry. Commitment, therefore, follows from the weighing arguments and evaluating systems of knowledge.

According to Perry (1970) very few individuals reach the top level of epistemological development, save for those with much more education under their belts. Generally, he noted, most undergraduates fall within the dualistic range of thinking upon entering college and progress to more relativistic thinking by the end of their four years. However, it should be noted that although this tends to be the trend, it does not mean that all undergraduates do, in fact, become more relativistic by the time they finish. Furthermore, this also does not mean that one entering college necessarily falls at the dualistic stage. To be sure, Perry's scheme focuses on trends in development, although exceptions may be noted.

Research by Schommer (1993, 1998) provides additional support for the developmental scheme provided above. Interestingly, this has not been the intent of Schommer's research which has focused on "how epistemological beliefs influence comprehension and academic performance", thus "lead(ing) her to challenge the notion that epistemolocial beliefs were unidimensional and developed in fixed stages" (Hofer & Pintrich, 1997, p. 106). Even so, the

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following studies do indicate a progression in epistemological development over time and with educational experience. Schommer (1998) assessed adults of various ages and educational backgrounds to determine the how these variables may influence epistemological beliefs. She found somewhat differentiated effects for age and education. Specifically, age predicted beliefs in ability to learn, with older adults believing this ability to be more fixed. On the other hand, education level predicted how subjects viewed the nature of knowledge (as being simple versus complex and certain versus uncertain). According to Schommer, higher levels of education were associated with beliefs that knowledge was less simple and less complex. In a second study, Schommer (1993) compared junior college and university students in terms of their epistemological beliefs. Since junior college students often tend to be younger than university students, one might expect knowledge to be perceived by them to be simple, certain, and easy to learn. In fact, this is exactly what happened in her study.

Taken together, Schommer's research does provide logical consistencies with the schemes of Perry (1970) and Kitchener and King (1981). In fact, each of these bodies of research provides implications for how preservice teacher learning should be viewed. As it stands, many learning tasks presented by instructors during teacher education requires flexible application of learning strategies, these generally being affected by different perceptions of epistemological requirements. Thus, tasks that require engaging epistemological assumptions that exceed a student's developmental level may certain problems for the learning situation. This is not to say that challenge is unimportant to learning. Indeed, many researchers indicate that challenge is a necessary part of development (e.g., Perry, 1970 Piaget, 1972). However, it may be that excess incongruency may be inherently frustrating and highly demotivating to students.

Prior Knowledge: Relevance for Teacher Education

By the time preservice teachers begun college, they have acquired a significant amount of information about how students, schools, teachers, and classrooms operate. Indeed, over the course of their educational experiences, they have been exposed to countless teacher instructional strategies and epistemological assumptions underlying them, task requirements (also with accompanying epistemological assumptions), goal orientations within the classroom, behavior management techniques, and so on. In addition to obtaining these types of implicit understandings, some preservice teachers may also have been exposed to other, more direct, modes of instruction about the nature of schools and teaching. According to Super (1972), before

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individuals actually choose an occupation, they may go through an exploratory phase in which they actively seek information about their vocational preferences. Thus, individuals interested in teaching as an occupation may obtain additional information through independent reading and talking with practicing teachers. Whether obtained through implicit and/or explicit means, prior knowledge about the teaching occupation can have a significant impact on the present- and future-oriented cognition, behavior (Anderson, 1995), and motivation (Kuhl, 1987) of these individuals. To be sure, prior knowledge impacts both the preservice teachers' perceptions about the nature of teaching prior to and following goal commitment and their understandings related to training exercises.

This influence of prior knowledge and its effects on perception has been well-documented in research on the stability of preservice teachers' beliefs during training. For example, Weinstein (1990) studied preservice teachers' level of optimism for teaching before and after involvement in an introductory education course with a field experience component. It was hypothesized that following exposure to the field experience, optimism levels would decrease, presumably because these individuals would be exposed to the harsh realities of classroom life. Interestingly, optimism levels remained fairly high across measures. Furthermore, students' definitions of what constitutes a "really good teacher" did not vary much from the beginning to the end of the semester. One might infer that their original definitions, or prior knowledge conceptions, of good teaching influenced subsequent perceptions. In another study by Young (1995), preservice teachers and professional teachers were compared in terms of career plans and work perceptions. With regard to work perceptions, it was found that a relatively high correlation existed between the two groups. However, significant differences existed on seven items. Of particular note was that preservice teachers expected greater levels of teacher morale and student discipline than professional teachers. Although consistency was found on work perceptions across groups, it is possible that the consistency was more a by-product of the measurement instrument as opposed to meaningful similarities between groups. Specifically, the possibility exists that the instrument merely obtained general notions (prior knowledge conceptions) about teaching for both preservice and professional subjects, while also failing to capture the more complex beliefs of professionals. Items in which they differed are an indication of this potential difference. For example, preservice teachers' expectations for greater discipline reflects a very regimented and simplistic view of classroom management as opposed to professional teachers who likely held more complex, interactional perspectives (or knowledge).

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At this point, the intersection between epistemological development and prior knowledge becomes apparent. In essence, epistemological level of development may not only serve as a general problem-solving heuristic of for managing the problems with which one is faced. It may also serve as a constraint on the types of information one attends to and maintains within his/her schema. As mentioned above, preservice teachers likely hold epistemological beliefs that fall within the dualistic-relativistic (early) range. Thus, the types of information they attend to, construct, and store may also tend to be dualistic (or potentially relativistic) in nature given their present developmental levels. This, in all likelihood, has a significant impact on their perceptions of goal objects and tasks presented to them. Next, I will discuss the relationship between epistemological developmental level, prior knowledge, goal formation, and perceptions of task instrumentality.

Interaction Between Epistemological Development and Prior Knowledge: Influences on Goal and Task Perceptions

Although a significant amount of research has been generated on the influence of goals and task perceptions in the motivational literature, there has been little effort to link these constructs to individuals' epistemological development and its interaction with prior knowledge. As mentioned earlier, it appears that epistemological beliefs may have an impact both in terms of "online ' problem-solving and individuals' construction of knowledge. Thus, preservice teachers' developmental levels may influence how goals and instructional tasks are perceived during training. As conceived here, epistemological level of development may indirectly impact individuals' perceptions of goal objects via its influence of the content knowledge associated with those objects. In effect, epistemological beliefs may impact the types of information that students attend to and store – essentially leading to the attainment and maintenance of information that is congruent with current epistemological developmental patterns. For example, a preservice teacher who holds a dualistic perspective may be more likely to maintain a conception of teaching as a well-structured endeavor with problems that may be fixed as soon as one acquires the correct information. To be sure, because his/her epistemological level of development focuses on knowledge as absolute and certain, the individual's future classroom may be perceived as something that will hold few challenges beyond application of simple knowledge and algorithms. This does not mean that preservice teachers at the dualistic level of development have absolutely no conception of the tasks a teacher may be faced with. In fact, they may have ample knowledge to differentiate teaching from most other occupations. What

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these individuals may be missing, however, is an understanding of the complexity of teaching. In effect, it may be possible to have a differentiated, but not complex perspective on a goal object such as teaching.

As can be expected, epistemological beliefs may not only influence conceptions of goal objects. They may also have an impact on perceptions of tasks. Specifically, tasks may be more or less understood based on prior knowledge, which again may be influenced by epistemological beliefs. Thus, instructions requiring an integrative paper addressing the complexities of teaching may not be understood if one is functioning at the dualistic or relativistic levels of development. Essentially then, providing an ill-structured task to someone who perceives the world in well-structured terms may be perceived by the individual as asking him or her to fly – something that cannot be done.

At this point, it is necessary to address the issue of perceived task instrumentality. According to Husman and Lens (1999), instrumentality refers to one's perception that a behavior holds relevance for a desired future goal. This notion may also be expressed in the following way: "Will this particular task help me to attain my desired goal?" Defining instrumentality appears to be much simpler than explaining what exactly makes a particular task appear relevant to achieving a future goal. As mentioned earlier, one way in which to determine instrumentality is to explore the relationship between one's goal object and his/her self- schema. Those tasks that are intimately related to an individual's conception of him/herself in the future are perceived as endogenously instrumental (Husman & Lens, 1999), thus increasing intrinsic motivation. Those tasks that amount to "jumping through the hoops" in order to attain a goal are perceived as being exogenously instrumental, or extrinsic in nature. While this particular demarcation of instrumentality has provided a very useful way of conceiving what types of instrumentality is optimal for motivation to learn, it also leads to the question of "Why do these instrumentalities have the motivational effects that they do?" In other words "Why are some tasks more intimately related to an individuals' self-schema (and associated goals) than other tasks?" The answer may lay in the relationship between the perceived content structure of goals and epistemological requirements of learning tasks. I hypothesize that the structural fit between prior knowledge about goal objects and perceptions of epistemological requirements related to learning tasks may influence judgments of instrumentality. In effect, if there is a fit between the structure of one's goal object and task structure, perceptions of instrumentality may be perceived as being greater than when a lack of fit is perceived.

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The next question to be addressed is "Why might this be the case?" Perhaps the perceived lack of fit between goal and task may signal problems with transferability. For example, when a task with the epistemological requirement of constructing new knowledge (through ill-structured means) is considered in relation to a well-structured goal object (e.g. teaching as involving simple problems through finding the "correct" answer), the lack of congruence between the two may lead to the judgment that the task is less instrumental in nature. Indeed, for individuals holding the goal of becoming teachers (who solve well-structured problems), the most instrumental learning that they may engage in is to acquire absolute answers (which "should" be given by university instructors). In this case, "answers" may be perceived as more directly transferable than constructing knowledge that is individualized and "insightful".

How Are Judgments of Instrumentality Made?

Judgments of task instrumentality appear to be made in two ways: a) pre-decisional evaluation of the fit between task and goal structures prior to task engagement and b) self-task-goal evaluation based on performance feedback. These two processes are consistent with Bandura (1989) and Carver and Scheier's (1990) descriptions of goal formation and self-evaluation based on feedback. According to these authors, individuals form goals and make judgments about whether or not to engage in a task based on prior knowledge. Following task engagement, they subsequently evaluate their progress toward desired goal objects with the information they receive about their performance.

Heckhausen and Kuhl (1985) described motivation as a two-phasic process: pre-decisional and post-decisional. According to these authors, during the pre-decisional phase of motivation, individuals make evaluations based on prior knowledge about tasks and goals, assess the relative value of the goals that they form, and create possible behavioral pathways for achieving desired goals. Thus, it seems reasonable to assume that when individuals are presented with a task under external "control", they may also evaluate the fit between epistemological structure of that task and the structure of their primary goal. Upon perception of incongruence, perceived instrumentality and subsequent motivation may thus decrease. To provide an example, suppose a preservice teacher is presented with the task of writing reflective essays about how he/she may effectively manage a complex classroom ecology in the future. The nature of the task, in and of itself, provides a very ill-structured problem for the student. If the student per chance had somehow already developed some aspects of complex reasoning and, consequently, a more complex perspective on teaching (goal still being to be a teacher), then the individual may

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perceive the task as being more instrumental. That would be because the student knows that simple and certain knowledge may hold less relevance for the complexities of teaching and that exercises in more reflective and critical thinking may better prepare him/her for future classroom complexities. However, because many preservice teachers still fall within the earlier stages of epistemological development (Perry, 1970), they may perceive the complex task as providing information that is less transferable to their future chosen occupation.

The second manner in which tasks are judged as instrumental comes through the evaluation of performance feedback. According to Bandura (1989), feedback serves as a mechanism for altering ones' behavior so that eventually a desired goal state may be reached. A number of researchers have discussed the process of assessing progress and altering behavior in the wake of receiving feedback. For example, Shunk and Zimmerman (1998) included self-observation, judgment of behavior, evaluation, and modification of behavior as self-regulatory processes that are continually influenced by feedback. When feedback indicates to the learner that he/she is not progressing very well, a number of modifications occur in order to adjust behavior so that goal attainment may become more possible. This may entail seeking newer and more efficient strategies to self-regulate behavior and to maintain optimal motivation. In the case of incongruence between goal and task structures, feedback may indicate a need to engage in a new set of learning strategies – ones based on more relevant epistemological assumptions. The idea that strategies are affected by epistemological assumptions has indirectly been supported by research by Schommer (1990, 1993). For example, Schommer (1990) explored the effects of epistemological beliefs on reading comprehension. She found that beliefs in knowledge as being simple, certain, and quick, and ability as innate "predicted oversimplified conclusions, poor performance on the mastery test, and overconfidence in test performance" (p. 498). This suggests that the aforementioned beliefs, which coincidentally appear to fit with Perry's conception of dualism, results in the implementation of learning strategies that de-emphasize deeper level processing (e.g. self-questioning) and self-monitoring of comprehension. Thus, feedback indicates the need to change not only current strategies employed, but also epistemological assumptions underlying student learning as well. Unfortunately, if Perry's (1970) developmental sequence is accurate in describing epistemological changes over time, then it is unlikely that one could change strategies in order to support a stage of reasoning that is higher than his/her current level. In this case, feedback can do nothing but signal failure rather than address areas of potential improvement. Therefore, tasks signaling this type of failure may be perceived as less

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instrumental because they do not allow present a mechanism for improvement. For preservice teachers functioning at the dualistic level of development, failure to perceive progress towards their well-structured goal of teaching may signify that it is impractical to continue taking risks with uncertain knowledge. Tasks emphasizing ill-structured problem solving may be believed to simply provide no real solutions to practical problems.

Tying It All Together

This paper has attempted to demonstrate that preservice teachers' epistemological beliefs and prior knowledge may have a significant impact on their motivation to engage in tasks assigned to them during their university-based courses. Oftentimes, teacher education courses contain material related to the theory, history, and philosophy of education and attempt to incorporate such lofty goals as increasing higher-level, "critical thinking" skills in students. As such, many courses are discounted as not being instrumental to becoming a teacher because they lack "practical knowledge" (Kagan, 1992). It is often assumed that the reason for devaluing these types of subjects within courses is that teachers in training are merely unwilling to learn, or unwilling to exert the correct amount of cognitive effort. Instead, the answer may partially lie in how they perceive the structure of goal objects and tasks. Indeed, the possibility exists that incongruency between self-created goals and tasks that are externally administered decreases perceptions of instrumentality. This may result in efforts of students to seek out practical knowledge in ever increasing amounts both during and following their teacher education programs. Furthermore, negative performance feedback may pose a threat to the self-concepts of many students. Consequently, many preservice teachers may choose work avoidance (Meece, 1994) and self-handicapping strategies as a way of preventing the negative self-evaluations and affect associated with perceived performance failures (Garcia & Pintrich, 1994).

Given the possibility that structural incongruence may impact perceived task instrumentality, the question arises as to what teacher educators should do in order to increase student motivation. After all, it has been well-established that incongruence is a powerful motivator for behavior (Bandura, 1989), as well as a key component in the developmental process itself (Perry, 1970; Piaget, 1972). Upon reflection, it should become apparent that one aspect of incongruence has not yet been noted – that of degree. Perhaps, then, incongruence becomes particularly demotivating when incongruence between task and goal object structures occurs at the extreme. Therefore, it seems appropriate to postulate that injecting small to moderate amount of incongruence into teacher preparatory activities may actually be beneficial

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in encouraging perceptions of task instrumentality, as well as developmental progress. It can be stated that Piaget (1969) assumed that disequilibrium serves to motivate individuals to resolve incongruency. This is done through active efforts to modify one's schema to suit discrepant information. Bandura (1989) made a similar point in his attention to goals and feedback as producers of disequilibrium – essentially causing individuals to modify their behavior in order to attain valued goals. Although there is not a large amount of discussion by either theorist on "how much" disequilibrium is optimal, Vygotsky's (1978) conception of the zone of proximal development is instructive at this point. Specifically, teacher educators may choose to engage their students in tasks that hold epistemological requirements that are slightly above their developmental level – progressively leading them into areas of more complex thought. The benefit of this approach, therefore, may be that preservice teachers not only develop their thinking (including notions of complexity), but also may develop a wider range of strategies that they may apply when faced with various epistemological requirements.

As a final point of discussion, it is necessary to consider the research implications for the hypothetical model proposed in this paper. Psychological theory and research has been and continues to be very segmented in nature. Indeed, it is clear that there are numerous divisions within the field that not only refuse to cross theoretical or research boundaries with any regularity, but rather vie against each other for the small amount of resources that are available for psychological study. Within this paper, I have attempted to provide a model that cuts across motivational, developmental, and teacher education research and theory. The point here is that in order to get a clearer picture of what kinds of challenges preservice teachers and their instructors face, it is necessary to seek some type of integrated perspective on the problem. Therefore, I suggest that future research in teacher education address the relationship between epistemological development, goal conceptions, and beliefs about task requirements during instruction. To be sure, in order for teacher educators to provide instrumental instruction, they must understand how these three variables contribute to student apathy and frustration. Future questions to be addressed are as follows: How can the structure of goal objects and task requirements be operationalized? How do perceptions of instrumentality differ when the task is perceived as ill-structured and the goal is well-structured versus the opposite scenario? How do epistemological beliefs relate to students' goal orientations within the classroom?

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Conclusion

This paper reviewed problems with the perceived relevance of teacher education and introduced a framework for better understanding the motivational problems of preservice teachers. It was argued that perceptions of incongruity between task structure and the structure of goal conceptions result in decreased perceptions of task instrumentality. Furthermore, the instrumentality judgments were hypothesized to be based on two mechanisms: a pre-decisional evaluative mechanism and self-task-goal evaluations based on performance feedback. Finally, I argued that future theory, research, and practice in should incorporate more cross-domain integration in order to benefit future teacher education. Indeed, it is possible that only through integration can relevance issues within teacher education be solved.

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